

DRAFT CTPAC-SC Proposal

SUBJECT: Axle Width Minimum and Single Tire Use On Permit-Required Vehicle Operation

DATE: July 31, 2008

POLICY: Transportation Permit Manual Chapter 1 Section 106.41

I. OBJECTIVE

To revise the axle width minimum of 96" on permit-required vehicle operation found in the Transportation Permits Manual Chapter 1 General Provisions section 106.4.1 (dated 2/23/90) by approving the use of the new generation wide base single (NGWBS) tires of sizes 445/50R22.5 and 455/55R22.5.

II. BACKGROUND

A. CALTRANS Transportation Permits Manual - Chapter 1 General Provisions section 106.4.1 (dated 2/23/90) 13th bullet states that for permit-required operation:

- The maximum axle width measured from the extreme width of the axle or tire on the left side to the extreme width of the axle or tire of the same axle on the right side if extra legal weight is required. Do not measure loaded induced tire bulge. Actual measurements are required. Do not "round-off". Axle width shall be a minimum of 96 inches to qualify for extralegal weight except that dollies used in beam and dolly operations may be allowed a proportionate amount of straight purple chart weight.

Eight tired axles shall be a minimum of 96 inches wide in order to qualify for the 15 percent bonus and 120 inches wide to qualify for the 25 percent bonus. All tires per axle must be of equal size. Tires must have capacity for the weight requested.

If the 96" axle width minimum is not measured, the permit is rejected during the CALTRANS heavy haul inspection.

- In an October 16, 2006 incident from a user using the 455/55R22.5 NGWBS tires (on 2" outset wheels) on the tractor, the measured axle width was 94" when measured as above. This resulted in his permit being rejected.

B. New Generation Wide-Base Single (NGWBS) - tires designed to replace a set of dual tires at the tractor drive and/or trailer positions. They were designed to be interchangeable with the dual tires without any change to the vehicle. The new 445/50R22.5 tire replaces 275/80R22.5 duals, and the 455/55R22.5 tire replaces either 11R22.5 or 275/80R24.5 tires. Michelin and Bridgestone offer the 445/50R22.5 size while only Michelin offers the 455/55R22.5 size of these new tires. Other manufacturers may offer similar tires.

The NGWBS tire technology is intended for use on commercial vehicles as classified by the Federal Highway Administration Section 383.91, e.g. Groups A, B, and C.

The NGWBS tire technology is vastly different than the earlier generation “Super Single” tires that are designed for the on-off road use versus the highways and roads used for commercial purposes.

- The 445/50R22.5 and 455/55R22.5 NGWBS tires differ from the “Super Single” tires that are commonly sized as 385, 435, or 445/65R22.5.
- NGWBS wider footprints/tread width versus the “Super Singles” provide for essentially equivalent tire/pavement contact stresses when compared to the conventional dual tire assembly.
- The track width of the vehicle is wider (when a 2”outset wheel is used) than an axle fitted with conventional dual tires, therefore, improving stability.
- Improved tire maintenance, e.g. inflation pressure, of the single tire versus the difficulties of maintaining the inner tire of a conventional dual tire assembly provides safer tire operation and vehicle safety. Differences between the outer and inner tire of a conventional dual tire assembly creates a potential tire performance issue for both tires, as well as increasing the tire/pavement contact stresses by virtue of the different tire pressures.
- The potential benefits of the NGWBS tire technology include improved fuel economy , reduced un-sprung weight (~800 lbs/ five axle combination vehicle) which helps improve handling, lower operational cost, reduced maintenance and improved safety due to improved ride and handling in all weather conditions.
- A 2007 Federal Highway Administration international “Wide Base Tire” specialty pavement workshop had representation from academia, government agencies including Canada, France, Netherlands, U.S., and South Africa, tire industry, and end users represented by ATA. The attendees generally accepted that the NGWBS tires are close to if not equal to standard duals in pavement damage. They equally felt that the NGWBS tires (not the “Super Singles”) merited an effort of support due to their environmental benefits.
- A U.S. EPA SmartWay study published by SAE in 2005 showed a reduction in fuel use of 6% at 55 mph, 12% at 65 mph and 10% in a suburban loop. The NO_x reductions were 36%, 30% and 13% respectively.
A second SmartWay study published by SAE in 2007 supported the tire contributions to fuel savings and NO_x emission reduction.

III. EXISTING DOCUMENTATION

A. Transportation Permit Manual - Section 106.4.1 of the Transportation Permit Manual states, in the pertinent part, the following:

The maximum axle width measured from the extreme width of the axle or tire on the left side to the extreme width of the axle or tire of the same axle on the right side if extra legal weight is required. Do not measure loaded induced tire bulge.

Actual measurements are required. Do not “round-off”. Axle width shall be a minimum of 96 inches to qualify for extralegal weight except that dollies used in beam and dolly operations may be allowed a proportionate amount of straight purple chart weight.

Eight tired axles shall be a minimum of 96 inches wide in order to qualify for the 15 percent bonus and 120 inches wide to qualify for the 25 percent bonus. All tires per axle must be of equal size. Tires must have capacity for the weight requested.

B. California Vehicle Code (CVC)

No references to minimum axle width on permit-required commercial motor vehicles found in the California Vehicle Code.

C. Caltrans Memo

The Requestor is aware of the July 3, 2000 CALTRANS Transportation Permits Policy Memorandum (TPPM 2000-6) on the subject of “Super Single Tire Size”.

TPPM 2000-6 changed Section 302.1 – Minimum Vehicle Size with the following sentence:

- “Super single tires of a minimum size of 18” x 19.5” are an acceptable substitute for dual tires. The metric equivalent cross section width of 445 mm is also acceptable. Tires marked by the manufacturer with a 17.5” cross section width will be treated as 18” tires.”

IV. CURRENT PRACTICE

The current practice of Caltrans Transportation Permits Manual Chapter 1 Section 106.4.1 is to allow axle width shall be a minimum of 96 inches to qualify for extralegal weight except that dollies used in beam and dolly operations may be allowed a proportionate amount of straight purple chart weight.

Axle width in the TPM is measured from the extreme width of the axle or tire on the left side to the extreme width of the axle or tire of the same axle on the right side if extra legal weight is required.

If the 96” axle width minimum is not measured, the permit is rejected during the CALTRANS heavy haul inspection.

V. PROPOSED CHANGES

A. Transportation Permit Manual

This proposal seeks to:

- Change Chapter 1 Section 104.6.1 of the Transportation Permit Manual regarding axle width minimum for permit-required operation.

The specific change to Section 106.4.1 is as follows (**bold text**):

- The maximum axle width measured from the extreme width of the axle or tire on the left side to the extreme width of the axle or tire of the same axle on the right side if extra legal weight is required. Do not measure loaded induced tire bulge. Actual measurements are required. Do not “round-off”. Axle width shall be a minimum of 96 inches to qualify for extralegal weight except that dollies used in beam and dolly operations may be allowed a proportionate amount of straight purple chart weight.

New generation wide base single tires of a minimum section width of 17 inches are an acceptable substitute for dual tires. The metric equivalent cross section width of 445 mm as marked on the tire by the manufacturer is also acceptable.

Eight tired axles shall be a minimum of 96 inches wide in order to qualify for the 15 percent bonus and 120 inches wide to qualify for the 25 percent bonus. All tires per axle must be of equal size. Tires must have capacity for the weight requested.

VI. BENEFITS/IMPACT/JUSTIFICATION

See the “Background” above.

The use of the NGWBS tires on the 2” outset wheels results in a wider “track width” (measured from the center of the tread area of one tire to the center of the tire on the opposite end of the axle) of the vehicle than an axle fitted with conventional dual tires, therefore, improving vehicle stability.

In addition, the pending California Air Resource Board (CARB) requirements under California AB32 Global Warming Solutions Act of 2006 requires the use of the NGWBS tires that are approved by the U.S. EPA SmartWay program in order for vehicle operational compliance in California.

The current state of CALTRANS TPM Chapter 1 Section 106.4.1 would reject the permits for those vehicles using such NGWBS tires in order to comply with the AB32 requirements.

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